



SUMMER BOOKS

As the wild blue yonder beckons and labs and classrooms empty, *Nature's* regular reviewers share their holiday reads.

EDITORS' CHOICE



The Extreme Life of the Sea

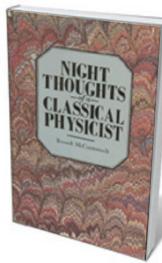
STEPHEN R. PALUMBI AND ANTHONY R. PALUMBI
Princeton University Press: 2014.

As generations of inspiration-seeking fiction writers can affirm, nature's strangeness stretches the limits of our imagination. This gem of a book by marine biologist Stephen Palumbi and his son, science writer Anthony Palumbi, finds enough weirdness in the ocean to feed creativity for generations to come.

One of my favourites is *Osedax mucifloris*, the "bone-eating snot flower"—a microbe-filled worm with no mouth or anus that lives on the bones of dead whales on the deep seabed. It looks, they write, "like nothing so much as the contents of a tissue after a sneeze".

The Palumbis' writing is a wonderful mix of meticulous science and creative panache. So, albatrosses have "vast white wings and the inner peace of a seraph", can fly 800 kilometres a day over open ocean, surfing "on the thin current of air pushed ahead by the wave". Meanwhile, the lumpy knobs of flesh that disrupt the smooth leading edge of a humpback-whale flipper reduce drag—a trick that seems to work for wind-turbines too. Coming soon to a hillside near you: turbine blades like whale flippers. A joy whether read at one sitting, or dipped in and out of to prolong the pleasure.

Callum Roberts is a marine conservation biologist at the Environment Department, University of York, UK.



Night Thoughts of a Classical Physicist

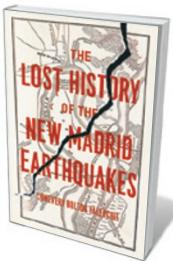
RUSSELL MCCORMACH
Harvard University Press: 1982.

Germany, 1918: a classical physicist is having night thoughts of loss. His starving country is losing the Great War; his institute is rife with infighting; he easily loses focus and has fainted during a lecture. Worst of all, he thinks, his clean, logical, orderly physics is dissolving into chaos.

Russell McCormach is a historian of physics, and this book is its own genre: a novel constructed from scholarship, whose main character is a composite of historical physicists and in which every conversation, letter, room and thought is based on historical evidence.

The classical physicist worked with the mechanical world view, where light travels in waves through the ether's bright fluid and effects have causes. The modern physics of Max Planck and Albert Einstein said that light is both wave and particle, and no ether exists. Later, Werner Heisenberg said that the world at its most fundamental is uncertain. This new physics must have been disorienting, demoralizing, even frightening. The novel's great virtue is how thoroughly the reader understands the anxiety that, as Planck wrote, is inherent in resisting meaninglessness and replacing it with mere incomprehensibility.

Ann Finkbeiner is a freelance science writer in Baltimore, Maryland, and author of *The Jasons and A Grand and Bold Thing*.



The Lost History of the New Madrid Earthquakes

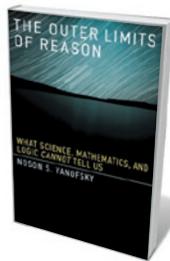
CONEVERY BOLTON VALENCIUS
University of Chicago Press: 2013.

Crack open this book and you are racing through Tennessee woods, tracking a bear with frontiersman Davy Crockett on a cold night in 1826. When the animal tumbles into one of the region's "earthquake cracks", Crockett dives after it, slaying the wedged bear with a knife.

Geology matters. As historian Conevery Bolton Valencius reveals, the trap was an effect of the unusual intraplate earthquakes of 1811–12, epicentred near New Madrid in Missouri's southern 'Bootheel'. Powerful enough to break glassware in Baltimore, Maryland, the quakes transformed the landscape of the middle Mississippi River, turning cropland into swamp.

Big chunks of US history have fractured along the zone's fault lines. The Bootheel was where the agrarian South of the eighteenth century abutted the industrial nineteenth-century North; the muddy Mississippi divided settled East from wild West. Weaving deep time with human time, Valencius gives us exemplary science history: accurate yet erudite, entertaining but substantial, adroitly marshalling the past to interpret the present.

Nathaniel Comfort is professor of the history of medicine at Johns Hopkins University in Baltimore, Maryland. His most recent book is *The Science of Human Perfection*.



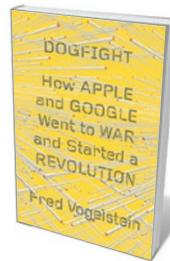
The Outer Limits of Reason: What Science, Mathematics, and Logic Cannot Tell Us

NOSON S. YANOFSKY
The MIT Press: 2013.

"The last function of reason," wrote French mathematician Blaise Pascal in the posthumously published *Pensées* (1669), "is to recognize that there is an infinity of things that are beyond it." That domain of ignorance is the subject of this unusual popular science book by computer scientist Noson Yanofsky. He follows in the footsteps of UK Astronomer Royal Martin Rees, who spoke eloquently on the topic in his 2010 Reith Lectures.

Steering well clear of complex mathematics, Yanofsky canters though language paradoxes, infinity puzzles, computing impossibilities, the scope of fundamental physics and what he believes to be the philosophical limitations of science. It is enjoyable ride, although I suspect that the author underestimates humanity's intellectual ingenuity. Pascal would, I believe, have been astonished by the extent of scientific progress over the past 350 years, especially now that subjects once out of reach, such as early-Universe cosmology, have gradually moved to within the gaze of enquiry and reason.

Graham Farmelo is a by-fellow at Churchill College, University of Cambridge, UK, and author of Churchill's Bomb.



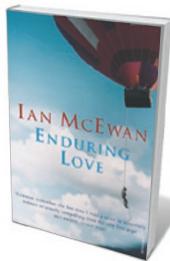
Dogfight: How Apple and Google Went to War and Started a Revolution

FRED VOGELSTEIN
Sarah Crichton: 2013.

Today, two mobile operating systems — Apple's iOS and Google's Android — run on most mobile phones and tablets, and are moving to other smart devices. These corporate superpowers battle directly for people's minds and pockets through proprietary ecosystems — devices, applications, services and content. Yet until recently, Google and Apple were business buddies: Apple's late co-founder Steve Jobs was mentor to Google counterparts Larry Page and Sergey Brin, for instance. What happened?

In August 2005, Google, intent on building an open mobile operating system for handsets, bought a start-up: Android. According to Walter Isaacson's biography of Jobs, Apple had begun work around the same time on the iPhone, because Jobs worried that handsets with good music players would outcompete the iPod. Thus the two companies inadvertently started on a collision course. In *Dogfight*, Fred Vogelstein deploys interviews with executives and key engineers from both companies to tell a refreshing inside story. If anyone wants to see why Silicon Valley still dominates global innovation, start here.

Li Gong is chief operating officer of the Mozilla Corporation.



Enduring Love

IAN MCEWAN
Jonathan Cape: 1997.

In the celebrated opening scene of Ian McEwan's *Enduring Love*, science writer Joe Rose is part of a group of men struggling at the ropes of a hot-air balloon — with a child in the basket — to keep the craft tethered to the ground. When a gush of wind lifts the balloon, they must decide in a split second whether to hold on or let go — and one of the men, the unemployed Jed Parry, is struck by the idea that Joe has fallen in love with him. As the novel unfolds, it becomes clear that Parry's behaviour is a sign of sudden-onset de Clérambault's syndrome, which centres on this delusion.

This slim thriller testifies articulately to McEwan's fascination with neuroscience, as does his novel *Saturday* (Jonathan Cape, 2005), whose protagonist has Huntington's disease.

Enduring Love is a harrowing exploration of the minds of two men, both of them victims: Parry, whose psychopathology propels him on a course of relentless stalking, and Rose, who sees his life fall apart as a result. Most scientific articles on de Clérambault's syndrome fail in helping us to understand the 'inside' of this delusion and the havoc it wreaks in the lives of sufferer and object alike. McEwan's fiction does, in an utterly convincing way. Don't read it late at night.

Douwe Draaisma is professor of the history of psychology at the University of Groningen in the Netherlands, and author of *The Nostalgia Factory*.



The War that Ended Peace: How Europe Abandoned Peace for the First World War

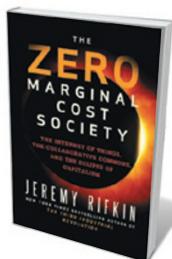
MARGARET MACMILLAN
Profile: 2013.

What mishaps, misunderstandings and mistakes directed so many countries into the First World War? These nations had been marching towards happiness and prosperity through scientific endeavour in communication, transport and energy.

Historian Margaret MacMillan has made this century-old story suspenseful: even knowing the end, we race through her masterful assemblage of people and powers. We visit irresponsible personalities (Kaiser Wilhelm II, all tantrums and ill-informed interference, and the daydreaming UK foreign secretary Edward Grey), unthinking competition (the race to build the most warships), and creaking empires, the Austro-Hungarian and Ottoman hoping, with Russia, that 'a little war' could re-establish their pre-eminence.

The saddest chapter concerns children in uniform and societies convinced that 'every generation needs a good cleansing war'. Armies planned only for a short, glorious attack; they were unequipped for years in the trenches, and a generation was lost to mud, misery and madness.

Margaret Catley-Carlson
serves in the Canadian Water Network and was establishing chair of the World Economic Forum's Global Agenda Council on Water Security.



The Zero Marginal Cost Society: The Internet of Things, the Collaborative Commons, and the Eclipse of Capitalism

JEREMY RIFKIN
Palgrave Macmillan: 2014.

Can big data make us happy? Social thinker Jeremy Rifkin thinks so — through the digitized global network the Internet of Things (IoT). In *The Zero Marginal Cost Society*, he posits how people, natural resources and more "will be linked via sensors and software to the IoT platform, continually feeding Big Data to every node — businesses, homes, vehicles". Rifkin sees the IoT as allowing economic exchange through a collaborative commons that will eclipse the capitalist marketplace and save the planet.

Rifkin is known for his insight on social and technological trends. Although he does not sufficiently explain how the IoT will reduce environmental problems, the book has many stimulating ideas on everything from bitcoin and prosumerism to the smart economy. If you are not a millennial and have yet to try crowdfunding, this is for you. Pull up a garden chair — just remember to turn on the Wi-Fi.

Gail Whiteman is professor of sustainability, management and climate change at the Rotterdam School of Management, Erasmus University, the Netherlands.



The Autistic Brain: Thinking Across the Spectrum

TEMPLE GRANDIN & RICHARD PANEK

Houghton Mifflin Harcourt: 2013.

Temple Grandin, autism's straight-talkin', cattle-handlin' answer to neurologist Oliver Sacks, is back. This time she's playing the lab rat. Grandin takes every new test she fancies to see how science is squaring up to autism — the social, sensory and physical disorder that has more than 1 in 100 people in its grip. Brain scans reveal Grandin's visual cortex to be underwhelmed by faces; an auditory trial confirms that she cannot pick out one voice in a clot of others; even her famed picture thinking is stumped by some spatial tasks. She finds lots of promising leads from neuroscience and genetics, but too few translating to the clinic. Although knowledge about the condition has grown in some ways since the 1940s, "in other ways", she chides, "we're just as confused as ever".

In this, Grandin's eighth book on autism, her prose has been wrangled by the physics writer Richard Panek. The result is better organized than some of her previous works but I missed her unique voice. Plus there is nothing about the malfunctions in digestion and metabolism that some believe are central to autism. Nonetheless, Grandin's tour of what scientists know about autism (embarrassingly little) and how that reflects or alters the lived experience of people on the spectrum and their carers (not enough) is a much-needed call to action.

Sara Abdulla is Nature's chief commissioning editor.

White Beech: The Rainforest Years

GERMAINE GREER
Bloomsbury: 2014.

In 2001, Australian feminist writer Germaine Greer took on a new challenge. "As a lamb to the slaughter", she acquired 60 hectares of Queensland pasture and rainforest. Logged and farmed for a century, the land was now neglected and choked with lantana canes. In *White Beech*, Greer documents how she brought the bedraggled patch back to health and established it as a nature reserve.

Helped by her sister Jane, a botanist, Greer discovers that her abandoned holding is a paradise, filled with nut-festooned macadamia, flowering black bean and magnificent native white beech trees. Once prized for their soft timber, only about 100 white beeches remain in their original habitat. Other inhabitants include platypuses and quolls, pythons, kingfishers and owls. Greer pieces together the land's story, from the Aboriginal tribes who have long lived in the area to the European pioneers who exploited its bounty — from wood to koala skins. Her vivid, often funny, account doubles as a scholarly record of the precious ecology at the Cave Creek reserve.

Joanne Baker is senior comment editor for Nature.

Laboratory Life: The Social Construction of Scientific Facts

BRUNO LATOUR AND STEVE WOOLGAR
Sage: 1979.

It is 35 years since sociologists Bruno Latour and Steve Woolgar unleashed *Laboratory Life* on the world. The book draws on Latour's mid-1970s stint in the lab of brain-hormone researcher Roger Guillemin at the Salk Institute for Biological Studies in La Jolla, California.

Latour engaged in a research procedure analogous with that of an intrepid explorer of the Ivory Coast. His encampment in Guillemin's soon-to-be-Nobel-prizewinning lab, following bemused researchers at their — to him — arcane daily grind, was designed to capture "the construction of facts". He concluded that this happens through scientists producing papers, then using their status to convince others of the facts' correctness. Thus they gain "credit" that can be re-invested in producing more facts.

Many have objected to Latour's idea that researchers 'create' facts through selective work, rather than 'discovering' truths about the world. (Latour would later cross swords with mathematical physicist Alan Sokal, who famously critiqued cultural studies by publishing a hoax paper in the journal *Social Text*.) But although it is no easy read, *Laboratory Life* remains among the best outsider attempts to study science as a process. The questions arising from Latour's observations — Why are research papers valued? How is their content created? Who is deemed believable in science? — are as relevant today as they were in 1979.

Daniel Cressey is a reporter in Nature's London office.

Candy: A Century of Panic and Pleasure

SAMIRA KAWASH
Faber & Faber: 2013.

Once a luxury, sugar has become ingrained (often as a confusingly named additive) in the modern diet — even as it is increasingly viewed as problematic for our health. In *Candy*, Samira Kawash unwraps the spiralling 'candidification' of the United States, providing cultural insights into its twists and turns. We see the nineteenth-century explosion in manufacturing sweets, and early twentieth-century chemistry labs concocting novel products such as Numoline, made by splitting sugar into a mix of glucose and fructose. In the 1920s, 'lunch bars' were marketed as alternatives to a midday meal. One, Sperry Candy's 'Chicken Dinner' consisted of peanuts, corn syrup and milk. We are still hoodwinked by 'healthy' processed foods laden with corn syrup.

Throughout this sweet little history, one theme stands out. The status of confectionary is heavily influenced by the conflicting messages in multibillion-dollar marketing campaigns and the scientific evidence on the risks of overindulging in sugar. I was drawn to *Candy* while shunning sweetened food for six weeks. This book contextualized that challenge and brought home the need for a global look at the uses and abuses of sugar today.

Emily Banham is Books and Arts editorial assistant at Nature.

Off the Map: Lost Spaces, Invisible Cities, Forgotten Islands, Feral Places and What They Tell Us About the World

ALASTAIR BONNETT
Aurum: 2014.

Social geographer Alastair Bonnett is a documentalist of absence, ambiguity and loss. In his wonderful *Off the Map*, he explores 47 places that have evaded the cartographer — hidden, undefined, ephemeral or off-limits — all with “the power to provoke or disorient”. As we tour the half-built edifices of the Archaeological Park of Sicilian Incompletion, the Aralqum Desert (once the Aral Sea), a UK traffic island and the no-man’s-lands between borders, Bonnett reveals how such journeys into dislocation can jar us into awareness of a profound human urge: the love of place and its shadow, the need to escape.

Both are now being eroded by the intensive digital mapping of the planet, which puts at risk the secret and private and makes getting lost a lost cause indeed. This trend, he argues, is destroying our mental landscape: if everything is pinned down and chewed over, where are the mysteries that ignite our urge for discovery? And is cyberspace, as some now claim, more beguiling than terra firma? Like Bonnett (and Huck Finn), I’d rather “light out for the territory”.

Barbara Kiser is Nature’s Books and Arts editor.

Physics in Mind: A Quantum View of the Brain

WERNER R. LOEWENSTEIN
Basic: 2013.

In the delightful and challenging yet accessible *Physics in Mind*, Werner R. Loewenstein unpicks the brain through a physicist’s eyes. He reveals how evolution pushed molecules to become information scavengers and eventually built the neuron network that culminates in consciousness. Working up from basic principles, he takes physics concepts such as quantum theory and applies them to physiology, the senses and neuroscience. Along the way, he offers engaging insights into the parallels between these very different worlds.

After some intriguing diversions, such as one on the mechanics of gut feelings, Loewenstein concludes with the hypothesis that on at least one level, the brain could be a kind of quantum computer. It is a leap. But it is a relatively persuasive one, based on known examples of biological quantum phenomena (such as the coherent quantum waves that form when photoreceptor proteins in the eye respond to light) and similarities between parallel processing in the mind and in quantum computing. Readers hankering for a quantum answer to the mystery of consciousness will not find one here. But they will see how the brain performs the remarkable feat of extracting meaning from its environment.

Elizabeth Gibney is a reporter for Nature in London.

Infinitesimal: How a Dangerous Mathematical Theory Shaped the Modern World

AMIR ALEXANDER
Oneworld: 2014.

Since antiquity, great minds had struggled with a paradox: a line is the sum of its points, but each point has zero length, so how can the line have length? Galileo and other seventeenth-century scientists favoured a radical solution: that geometric objects are made of units whose size is ‘infinitesimally’ small but still not zero.

This seemed to fly in the face of the accepted rationalist tradition of Euclid, in which incontrovertible truths are deduced from a few basic, ‘self-evident’ axioms. And, historian Amir Alexander argues in this original book, the asymptotic fudge challenged the authority of the Catholic Church. The Jesuits had embedded Euclidean geometry into a hierarchical system of knowledge to help block the tide of Protestantism and re-establish Rome’s ideological hegemony.

As Alexander shows, Jesuit hostility and the order’s authority over the Inquisition destroyed the Renaissance spirit of inquiry. Recall, the Inquisition found Galileo guilty of heresy over his advocacy of a heliocentric Universe. Italy became a scientific backwater just as the ‘new science’, founded by Newton on infinitesimal calculus, began to flourish in England. Alexander does not discuss the nineteenth-century creation of rigorous foundations for calculus, which might leave some thinking the field was built on riddles. But his book is a triumph.

Davide Castelvecchi is Nature’s online news editor.

The Compatibility Gene: How Our Bodies Fight Disease, Attract Others, and Define Our Selves

DANIEL M. DAVIS
Allen Lane/Oxford University Press: 2013.

There is a case to be made that the last frontier of knowledge is not the edge of the Universe, or the world of the inaccessibly small, but something much closer to home: our immune system. For all its influence on nearly everything we do, much of it remains a mystery. And where popular-science shelves groan with books about cosmology and quantum mechanics, or evolution and dinosaurs, accessible books on immunology are almost non-existent.

Daniel Davis’s *The Compatibility Gene* goes a long way towards filling that void. Davis relates, with brio, the story of the early days of organ-transplant experiments. He shows how at root, it is thanks to the immune system that the body tells the difference between itself and foreign invaders — with implications for everything from the success of transplants and blood donation to the structure of society and choice of mate. It is not perfect, occasionally straying into hyperbole, but Davis gets a gold star simply for trying, and for putting over an arcane subject with such infectious enthusiasm. (Did I say ‘infectious’?).

Henry Gee is a senior biology editor for Nature.

From Pompeii: The Afterlife of a Roman Town

INGRID D. ROWLAND
Belknap: 2014.

From Pompeii is very much a tale of two cities — one preserved by Vesuvius's eruption in AD 79, the other the modern urban development beyond the gates of the remains. Eschewing the classic historical approach, Ingrid Rowland instead picks up the story once the dust has settled. Sifting through the 1,900 years since the ancient city's demise, she reveals the story of its rediscovery, the influence of its ruins on the cultural development of the modern landscape and, crucially, the problems faced by the artefacts and buildings that have slowly been brought to light.

Marshalling a stellar cast, including Mozart, Dickens, Renoir, Mark Twain and Ingrid Bergman, Rowland is ever engaging and offers diverting anecdotes. Nineteenth-century tourists, for instance, 'gassed' dogs by holding them over emanations of carbon dioxide rising from fissures in the Grotta del Cane.

The modern life of the ruins and town get equal billing. But the ancient site gets the last word, tempered by the growing realization of just how fragile Pompeii's remains are — a significant proportion of its paintings have already been lost to the elements. The site, with so many of its treasures under seemingly permanent lock and key, could now be reaching the end of its inspirational afterlife.

Colin Sullivan is Nature's chief subeditor.